Amendments of the Claims:

A detailed listing of all claims in the application is presented below. This listing of claims will replace all prior versions, and listings, of claims in the application. All claims being currently amended are submitted with markings to indicate the changes that have been made relative to immediate prior version of the claims. The changes in any amended claim are being shown by strikethrough (for deleted matter) or underlined (for added matter).

1. (Currently Amended) An improved apparatus for forming sheet glass, wherein the apparatus includes a trough for receiving molten glass that has sides attached to a wedged shaped sheet forming structure that has downwardly sloping weirs converging at the bottom of the wedge such that a glass sheet is formed when molten glass flows over the sides of the trough, down the downwardly sloping sides of the wedged shaped sheet forming structure and meets at the bottom of the wedge, and wherein the improvement comprises:

   an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, <u>wherein the flow control plug mechanism forms at least a portion of a bottom of the trough and</u> wherein the glass that flows in direct contact with the flow control plug mechanism ends up in an unusable far end bead.

2. (Original) The apparatus of claim 1, further comprising a glass seal, wherein the elements of the trough are held together with the glass seal such that small adjustments in a position of the flow control plug mechanism may be made.

3. (Original) The apparatus of claim 2, wherein when the weirs begin to sag due to extended use, the flow control plug mechanism is incrementally rotated along a centerline of the bottom of the trough to make glass of substantially uniform thickness.

4. (Original) The apparatus of claim 2, further comprising an inflow pipe for delivering molten glass to the trough, wherein the flow control plug mechanism is positioned at an end of the trough opposite the inflow pipe.

5. (Original) The apparatus of claim 2, wherein the flow control plug mechanism comprises at least one flow control plug.

6. (Cancelled)

7. (Cancelled)

8. (Currently Amended) The apparatus of claim 2~~6~~, wherein the flow control plug mechanism comprises at least two flow control plugs, and wherein, when the weirs begin to sag due to extended use, the flow control plugs may be independently raised or tilted out of a cavity in the bottom of the trough to make glass of substantially uniform thickness.

9. (Cancelled)

10. (Currently Amended) The apparatus of claim 2~~6~~, further comprising an inflow pipe for delivering molten glass to the trough, wherein the flow control plug mechanism is positioned at an end of the trough where molten glass is delivered from the inflow pipe.

11. (Currently Amended) The apparatus of claim 2~~6~~, wherein the bottom of the trough is substantially flat.

12. (Original) The apparatus of claim 11, further comprising an inflow pipe for delivering molten glass to the trough, wherein the flow control plug mechanism is positioned at an end of the trough where molten glass is delivered from the inflow pipe.

13. (Currently Amended) The apparatus of claim 2~~6~~, wherein the portion of the flow control plug mechanism forming the bottom of the trough is substantially flat.

14. (Currently Amended) The apparatus of claim 2~~6~~, wherein the portion of the flow control plug mechanism forming the bottom of the trough is contoured.

15. (Currently Amended) The apparatus of claim 2~~6~~, wherein the flow control plug mechanism is removable and replaceable.

16. (Original) The apparatus of claim 15, wherein the flow control plug has a contoured shape on both a top and a bottom along at least a portion of a length of the trough such that it can be installed in either a 0 degree or a 180 degree position.

17. (Original) The apparatus of claim 15, wherein the flow control plug has a top contoured shape along at least a portion of a length of the trough.

18. (Original) The apparatus of claim 15, wherein the flow control plug has a contoured shape along at least a portion of a length of the trough and a longitudinally adjustable top portion that pierces a top surface of the molten glass in the trough, wherein the top portion can be repositioned during operation to change at least one flow characteristic of the molten glass in the trough.

19. (Original) The apparatus of claim 1, wherein the flow control plug mechanism is inserted into the trough through a top surface of the glass at a far end of the trough, wherein the flow control plug mechanism is removable and replaceable.

20. (Original) The apparatus of claim 1, wherein the flow control plug mechanism is inserted into the trough through a top surface of the glass at a far end of the trough, wherein the flow control plug mechanism is adjustable vertically, horizontally and angularly during operation.

21. (Original) The apparatus of claim 20, wherein when the weirs begin to sag due to extended use, the flow control plug mechanism can be incrementally moved vertically, horizontally, or is tilted to make glass of substantially uniform thickness.

22. (Original) The apparatus of claim 20, wherein the flow control plug mechanism comprises at least two flow control plugs.

23. (Original) An improved method for forming sheet glass using an apparatus that includes a trough for receiving molten glass that has sides attached to a wedged shaped sheet forming structure that has downwardly sloping weirs converging at the bottom of the wedge such that a glass sheet is formed when molten glass flows over the sides of the

trough, down the downwardly sloping sides of the wedged shaped sheet forming structure and meets at the bottom of the wedge, and wherein the improvement comprises:

a) providing an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, wherein the glass that flows in direct contact with the flow control plug mechanism ends up in an unusable far end bead;

b) using the flow control plug to adjust at least one flow characteristic of the molten glass within the trough; and

c) flowing molten glass into the trough such that a glass sheet of substantially uniform thickness is formed.

24. (Original) The method of claim 23, further comprising the step of holding a plurality of elements of the trough together using a glass seal such that small adjustments in a position of the flow control plug mechanism may be made.

25. (Original) The method of claim 24, wherein the flow control plug mechanism is removable and replaceable.

26. (Original) The method of claim 23, wherein the flow control plug mechanism comprises at least one flow control plug.

27. (Original) The method of claim 23, wherein the flow control plug mechanism forms at least a portion of a bottom of the trough.

28. (Original) The method of claim 23, wherein a portion of the flow control plug mechanism pierces a top surface of the molten glass.

29. (Original) The method of claim 28, wherein the flow control plug mechanism is removable and replaceable.

30. (Currently Amended) An apparatus for forming sheet glass comprising:

an inflow pipe of appropriate structure for conveying molten glass under pressure;

a trough having sides and a top attached to the inflow pipe wherein the trough receives the molten glass;

an orifice running along the top of the trough having a width and a length such that as molten glass is conveyed to the trough the molten glass exits through the orifice and passes down the sides of the trough~~, wherein as the orifice deforms over time, the orifice maintains a linear flow characteristic with respect to all locations along the orifice except at the ends of the orifice~~; and

a wedged shaped sheet forming structure attached to the trough having a wedge at the bottom of the structure such that a glass sheet of substantially uniform thickness is formed when molten glass passes down the sides of the trough and meets at the bottom of wedge;

wherein as the width of the orifice changes during a duration of a production campaign as the orifice deforms due to thermal creep caused by internal hydrostatic pressure, a structure of the orifice, the width of the orifice, and the length of the orifice at each location along the orifice are designed such that a linear flow characteristic is maintained with respect to all locations along the orifice except at the ends of the orifice.

31. (Original) The apparatus of claim 30, wherein as the orifice is made larger by a stress applied to the apparatus, a percentage width increase is the same at all locations along the orifice such that a percentage increase in glass flow is also the same at all locations along the orifice.

32. (Original) The apparatus of claim 30, wherein as the orifice is made larger by a stress applied to the apparatus, a percentage width increase at all locations along the orifice is proportioned to account for a change in internal hydrostatic pressure caused by a deformation of the apparatus in order to maintain equal glass flow at all locations along the orifice except at the ends of the orifice.

33. (Currently Amended) The apparatus of claim 3~~02~~, wherein the orifice has a varying shape along its length.

34. (Currently Amended) The apparatus of claim 3~~02~~, wherein a top surface of the orifice is concave.

35. (Currently Amended) The apparatus of claim 3~~02~~, wherein a top surface of the orifice is convex.

36. (Currently Amended) The apparatus of claim 3~~02~~, wherein a top surface of the orifice is substantially flat.

37. (Currently Amended) The apparatus of claim 3~~02~~, wherein the trough has a circular shape in cross section along its entire length.

38. (Currently Amended) The apparatus of claim 3~~02~~, wherein the trough has a trapezoidal shape in cross section in a center of the trough and a rectangular shape at each end of the trough.

39. (Currently Amended) The apparatus of claim 3~~02~~, further comprising a plurality of end support blocks to control ~~the~~ a deformation of the orifice ~~forming apparatus~~ caused by ~~the~~ a hydrostatic stress applied to the trough.

40. (Original) The apparatus of claim 39, wherein two upper support blocks are located at a first, inlet end of the trough and two upper support blocks are located at a second, far end of the trough, wherein the upper support blocks are attached to an edge of the orifice and exert a compressive force on the orifice to counteract an effect of a hydrostatic force.

41. (Original) The apparatus of claim 39, wherein the end support blocks comprise eight end support blocks, wherein five of the end support blocks are located at a first inlet, end of the trough, wherein the five inlet end support blocks comprise a lower inlet end support block and two sets of inlet end orifice support blocks, and three of the end support blocks are located at a second, far end of the trough, wherein the three far end support blocks comprise a lower far end support block and one set of far end orifice support blocks, wherein a longitudinal compression force is applied to the lower inlet end support block

and the lower far end support block and a lateral force is applied to the inlet end orifice support blocks and the far end orifice support blocks.

42. (Currently Amended) The apparatus of claim 3~~02~~, wherein a percentage change in a rate of flow of molten glass over time is equal at all locations along the orifice except at the ends of the orifice.

43. (Cancelled)

44. (Original) The apparatus of claim 30, further comprising an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, wherein the glass that flows over a top of the flow control plug mechanism ends up in an unusable far end bead.

45. (Currently Amended) A method for forming sheet glass comprising:

a) providing an inflow pipe connected to a trough having sides and a top attached to the inflow pipe;

b) designing an orifice running along the top of the trough having a width and a length such that as molten glass is conveyed to the trough, a uniform flow of the molten glass exits through the orifice and passes down the sides of the trough;

c) providing the orifice;

d~~e~~) providing a wedged shaped sheet forming structure attached to the trough having a wedge at a bottom of the structure; ~~and~~

e~~d~~) conveying molten glass through the inflow pipe into the trough such that the molten glass exits through the orifice and flows down the sides of the trough and meets at the bottom of the wedge and forms a glass sheet of substantially uniform thickness;

f) calculating via finite element analysis a change in orifice width produced by

thermal creep for an assumed structure;

g) redesigning the orifice, which has a uniform linear flow characteristic at all locations along the orifice except at the ends of the orifice at an initial width, at least one intermediate width and a final width, using computational fluid dynamics;

h) calculating a new width change with the assumed structure via finite element analysis, using the pressure information and an orifice shape from step f); and

i) using an iterative procedure of changing a structural design and an orifice size and shape until a solution converges to a useable design.

46. (Cancelled)

47. (Currently Amended) The method of claim 45~~6~~, further comprising the step of redesigning the orifice such that, as the orifice deforms over time, the orifice maintains a linear flow characteristic at all locations along the orifice except at the ends of the orifice.

48. (Currently Amended) The method of claim 45~~6~~, further comprising the step of proportioning the width and the length of the orifice such that a restriction to glass flow through the orifice is equal at all locations along the orifice except at the ends of the orifice.

49. (Currently Amended) The method of claim 45~~6~~, further comprising the step of designing the wedge shaped sheet forming structure which supports the orifice such that a deformation of the apparatus structure over time due to thermal creep maintains the orifice at a constant width at all locations along the orifice except at the ends of the orifice.

50. (Original) The method of claim 49, further comprising the step of designing the wedge shaped sheet forming structure such that the constant width calculated is biased to account for a change in internal hydrostatic pressure caused by a deformation of the apparatus in order to keep the glass flow equal at all locations along the orifice except at the ends of the orifice.

51. (Currently Amended) An apparatus for forming sheet glass comprising:

an inflow pipe of appropriate structure for conveying molten glass under pressure;

a trough having sides and a top attached to the inflow pipe wherein the trough receives the molten glass;

an orifice running along the top of the trough having a width and a length such that as molten glass is conveyed to the trough the molten glass exits through the orifice and passes down the sides of the trough~~, wherein as the forming apparatus deforms over time, the orifice maintains a constant width with respect to all locations along the orifice except at the ends of the orifice~~; and

a wedged shaped sheet forming structure attached to the trough having a wedge at the bottom of the structure such that a glass sheet of substantially uniform thickness is formed when molten glass passes down the sides of the trough and meets at the bottom of the wedge;

wherein as the forming apparatus changes shape during the duration of a production campaign as the orifice deforms due to thermal creep caused by internal hydrostatic pressure, a structure of the orifice, the width of the orifice and the length of the orifice at each location along the orifice are designed such that the orifice maintains a substantially constant width with respect to all locations along the orifice except at the ends of the orifice.

52. (Currently Amended) The apparatus of claim 51, wherein any ~~the~~ width change is proportioned to account for a change in internal hydrostatic pressure caused by a deformation of the apparatus in order to keep the glass flow equal at all locations along the orifice except at the ends of the orifice.

53. (New) An improved apparatus for forming sheet glass, wherein the apparatus includes a trough for receiving molten glass that has sides attached to a wedged shaped sheet forming structure that has downwardly sloping weirs converging at the bottom of the

wedge such that a glass sheet is formed when molten glass flows over the sides of the trough, down the downwardly sloping sides of the wedged shaped sheet forming structure and meets at the bottom of the wedge, and wherein the improvement comprises:

an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, wherein the glass that flows in direct contact with the flow control plug mechanism ends up in an unusable far end bead; and

an inflow pipe for delivering molten glass to the trough, wherein the flow control plug mechanism is positioned at an end of the trough opposite the inflow pipe.

54. (New) An improved apparatus for forming sheet glass, wherein the apparatus includes a trough for receiving molten glass that has sides attached to a wedged shaped sheet forming structure that has downwardly sloping weirs converging at the bottom of the wedge such that a glass sheet is formed when molten glass flows over the sides of the trough, down the downwardly sloping sides of the wedged shaped sheet forming structure and meets at the bottom of the wedge, and wherein the improvement comprises:

an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, wherein the flow control plug mechanism is inserted into the trough through a top surface of the glass at a far end of the trough, wherein the glass that flows in direct contact with the flow control plug mechanism ends up in an unusable far end bead.

55. (New) The apparatus of claim 54 wherein the flow control plug mechanism is removable and replaceable.

56. (New) The apparatus of claim 54, wherein the flow control plug mechanism is adjustable vertically, horizontally and angularly during operation.

57. (New) An improved apparatus for forming sheet glass, wherein the apparatus includes a trough for receiving molten glass that has sides attached to a wedged shaped sheet forming structure that has downwardly sloping weirs converging at the bottom of the wedge such that a glass sheet is formed when molten glass flows over the sides of the trough, down the downwardly sloping sides of the wedged shaped sheet forming structure and meets at the bottom of the wedge, and wherein the improvement comprises:

an internally mounted flow control plug mechanism that can be inserted and adjusted within the trough to change at least one flow characteristic of the molten glass within the trough, wherein the glass that flows in direct contact with the flow control plug mechanism ends up in an unusable far end bead; and

an inflow pipe for delivering molten glass to the trough, wherein the flow control plug mechanism is positioned at an end of the trough where molten glass is delivered from the inflow pipe.

58. (New) An apparatus for forming sheet glass comprising:

an inflow pipe of appropriate structure for conveying molten glass under pressure;

a trough having sides and a top attached to the inflow pipe wherein the trough receives the molten glass;

an orifice running along the top of the trough having a width and a length such that as molten glass is conveyed to the trough the molten glass exits through the orifice and passes down the sides of the trough, wherein as the orifice deforms over time, the orifice maintains a linear flow characteristic with respect to all locations along the orifice except at the ends of the orifice; and

a wedged shaped sheet forming structure attached to the trough having a wedge at the bottom of the structure such that a glass sheet of substantially uniform thickness is formed when molten glass passes down the sides of the trough

and meets at the bottom of wedge;

wherein a top surface of the orifice is selected from the group consisting of a concave surface, a convex surface, and a substantially flat surface.

59. (New) An apparatus for forming sheet glass comprising:

an inflow pipe of appropriate structure for conveying molten glass under pressure;

a trough having sides and a top attached to the inflow pipe wherein the trough receives the molten glass;

an orifice running along the top of the trough having a width and a length such that as molten glass is conveyed to the trough the molten glass exits through the orifice and passes down the sides of the trough, wherein as the orifice deforms over time, the orifice maintains a linear flow characteristic with respect to all locations along the orifice except at the ends of the orifice;

a wedged shaped sheet forming structure attached to the trough having a wedge at the bottom of the structure such that a glass sheet of substantially uniform thickness is formed when molten glass passes down the sides of the trough and meets at the bottom of wedge; and

a plurality of end support blocks to control a deformation of the orifice caused by a hydrostatic stress applied to the trough.